CLAIMS

1. A method for compressing video information in a video sequence (I_t, I_{t+1}) comprising the steps of :

. considering in said sequence a first video frame (B_t) containing image data ;

. segmenting said first video frame (B_t) into segments ($S_{t,i}$) ;

. for each segment ($S_{t,i}$) of the first video frame (B_t) :

- searching, in a second video frame (I_{t+1}) following the first video frame (B_t) in the video sequence, a corresponding predicted segment ($S^{p,forward}_{t+1,i}$) which matches with the segment ($S_{t,i}$) of the first video frame (B_t) according to a predetermined similarity measure ;

- calculating a raw set of motion parameters ($M^p_{t,i}$) describing the motion between the segment ($S_{t,i}$) of the first video frame (B_t) and the corresponding predicted segment ($S^{p,forward}_{t+1,i}$) of said second video frame (I_{t+1}) ; and

. for each corresponding predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}):

- searching, in the first video frame (B_t), a corresponding segment ($S^{p,backward}_{t,i}$) that matches with the predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}) according to a predetermined similarity measure ;

- calculating a best set of motion parameters ($M^p_{t,i} + \Delta M^p_{t,i}$) describing the motion between the corresponding segment ($S^{p,backward}_{t,i}$) of the first video frame (B_t) and the predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}), said best set of motion parameters consisting in the raw set of motion parameters ($M^p_{t,i}$) corrected by a motion parameters correction ($\Delta M^p_{t,i}$).

2. A method according to claim 1, characterized in that it includes a step of calculating a residual frame (R_{t+1}) for the second video frame (I_{t+1}) describing the structural differences between the first video frame (B_t) and the second video frame (I_{t+1}).

3. A method according to any one of claims 1 and 2, characterized in that it includes a step of calculating a set of overlapping parameters for each predicted segment ($S^{p,forward}_{t+1,i}$) resolving the intersections between said predicted segment ($S^{p,forward}_{t+1,i}$) and adjacent other predicted segments of the second video frame (I_{t+1}).

4. A method according to any one of claims 1 and 2, characterized in that it includes a step of calculating, for each video frame (B_{t+1}), a set of overlapping parameters resolving the intersections between the predicted segments of the second video frame (I_{t+1}).

5. A method according to any one of claims 1 and 2, characterized in that the first video frame (B_t) is a decompressed video frame corresponding to a frame (I_t) of the video sequence processed by said compression method and the corresponding decompression method.

6. A method according to any one of the preceding claims, characterized in that the best set of motion parameters ($M^p_{t,i} + \Delta M^p_{t,i}$) is defined according to a multi-layer motion description in which a first layer contains the raw set of motion parameters ($M^p_{t,i}$) and a second layer contains the motion parameters correction ($\Delta M^p_{t,i}$), the information of the first and second layers being distinguished.

7. A method according to claim 6, characterized in that it includes a step of setting a flag to a first or a second predetermined value indicating whether the motion parameters correction ($\Delta M^p_{t,i}$) has to be used for the video information decompression.

8. A method according to any one of the preceding claims, characterized in that it includes a step of determining a set of segmentation parameters defining the segmentation process implemented for segmenting the first video frame (B_t) into segments ($S_{t,i}$).

9. A method for decompressing video information in a video sequence (I_t, I_{t+1}) comprising :

. considering a first video frame (B_t) containing image data;

. segmenting said first video frame (B_t) into segments ($S_{t,i}$);

. for each segment ($S_{t,i}$) of the first video frame (B_t), defining a projected segment ($S^p_{t+1,i}$) by applying to the segment ($S_{t,i}$) of the first video frame (B_t), a raw set of motion parameters ($M^p_{t,i}$) describing the motion between the segment ($S_{t,i}$) of the first video frame (B_t) and the corresponding projected segment ($S^p_{t+1,i}$) and

. for each corresponding projected segment ($S^p_{t+1,i}$):

- finding in the first video frame (B_t) a corresponding improved segment ($S^b_{t,i}$) using both the raw set of motion parameters ($M^p_{t,i}$) and a motion parameters correction ($\Delta M^p_{t,i}$), the corresponding improved segment ($S^b_{t,i}$) being the segment of the first video

frame (B_t) that would be projected on the corresponding projected segment ($S^p_{t+1,i}$) by applying to it the raw set of motion parameters ($M^p_{t,i}$) corrected by the motion parameters correction ($\Delta M^p_{t,i}$) ; and

- defining a corrected projected segment ($S^{p;o;c}_{t+1,i}$) by applying the raw set of motion parameters ($M^p_{t,i}$) corrected by the motion parameters correction ($\Delta M^p_{t,i}$) to the corresponding improved segment ($S^b_{t,i}$).

10. A method according to claim 9, characterized in that it includes the steps of:

- considering a flag in the video information ; and

- calculating a corrected projected segment ($S^{p;o;c}_{t+1,i}$) by applying the raw set of motion parameters ($M^p_{t,i}$) corrected by the motion parameters correction ($\Delta M^p_{t,i}$) to the corresponding improved segment ($S^b_{t,i}$) if said flag has a first predetermined value and not calculating a corrected projected segment ($S^{p;o;c}_{t+1,i}$) if said flag has a second predetermined value.

11. A method according to claim 9 or 10, characterized in that it includes a step of applying a set of overlapping parameters to the projected segments ($S^p_{t+1,i}$) resolving the intersections between the adjacent projected segments ($S^p_{t+1,i}$).

12. A method according to any one of claims 9 to 11, characterized in that the step of segmentation of said first video frame (B_t) into segments ($S_{t,i}$) includes a step of applying a set of segmentation parameters contained in the video information and defining the segmentation process implemented for segmenting the first video frame into segments ($S_{t,i}$) during the compressing stage.

13. A computer program product for a data processing unit, comprising a set of instructions, which, when loaded into said data processing unit, causes the data processing unit to carry out the method claimed in any one of the preceding claims.

14. A device for compressing video information in a video sequence (I_t, I_{t+1}) comprising :

- means for segmenting the first video frame (B_t) containing image data into segments ($S_{t,i}$);

- means for searching, in a second video frame (I_{t+1}) following the first video frame (B_t) in the video sequence, a corresponding predicted segment ($S^{p;forward}_{t+1,i}$) which matches with

the segment ($S_{t,i}$) of the first video frame (B_t) according to a predetermined similarity measure, for each segment ($S_{t,i}$) of the first video frame (B_t) ;

- means for calculating a raw set of motion parameters ($M^{p}_{t,i}$) describing the motion between the segment ($S_{t,i}$) of the first video frame (B_t) and the corresponding predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}), for each segment ($S_{t,i}$) of the first video frame (B_t) ;

- means for searching, in the first video frame (B_t), a corresponding segment ($S^{p,backward}_{t,i}$) that matches with the predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}) according to a predetermined similarity measure, for each corresponding predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}) ;

- means for calculating a best set of motion parameters ($M^{p}_{t,i} + \Delta M^{p}_{t,i}$) describing the motion between the corresponding segment ($S^{p,backward}_{t,i}$) of the first video frame (B_t) and the predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}), said best set of motion parameters consisting in the raw set of motion parameters ($M^{p}_{t,i}$) corrected by a motion parameter correction ($\Delta M^{p}_{t,i}$), for each corresponding predicted segment ($S^{p,forward}_{t+1,i}$) of the second video frame (I_{t+1}).

15. A device for decompressing video information in a video sequence (I_t, I_{t+1}) comprising :

- means for segmenting said first video frame (B_t) containing image data into segments ($S_{t,i}$);

- means for defining a projected segment ($S^{p}_{t+1,i}$) for each segment ($S_{t,i}$) of the first video frame (B_t), by applying to the segment ($S_{t,i}$) of the first video frame (B_t), a raw set of motion parameters ($M^{p}_{t,i}$) describing the motion between the segment ($S_{t,i}$) of the first video frame (B_t) and the corresponding projected segment ($S^{p}_{t+1,i}$) ;

- means for finding, in the first video frame (B_t), a corresponding improved segment ($S^{b}_{t,i}$) using both the raw set of motion parameters ($M^{p}_{t,i}$) and a motion parameters correction ($\Delta M^{p}_{t,i}$), the corresponding improved segment ($S^{b}_{t,i}$) being the segment of B_t that would be projected on the corresponding projected segment ($S^{p}_{t+1,i}$) by applying to it the raw set of

motion parameters ($M^{p}_{t,i}$) corrected by the motion parameters correction ($\Delta M^{p}_{t,i}$), for each corresponding projected segment ($S^{p}_{t+1,i}$) ; and

- means for defining a corrected projected segment ($S^{p;o;c}_{t+1,i}$) by applying the raw set of motion parameters ($M^{p}_{t,i}$) corrected by the motion parameters correction ($\Delta M^{p}_{t,i}$) to the corresponding improved segment ($S^{b}_{t,i}$), for each corresponding projected segment ($S^{p}_{t+1,i}$).

16. Compressed data corresponding to a video sequence, characterized in that it has been obtained by a compression method according to any one of claims 1 to 8 and applied on said video sequence.